

### REMARKS

Claims 1, 25, 31, and 34 have been amended. Claims 37-39 have been added. Claims 24, 26, 27, and 33 were previously canceled. Claims 1-23, 25, 28-32, and 34-38 are pending in this application.

Claims 1-15, 25-26, 28-32, and 34-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nair et al., US Patent No. 6,366,320 (Nair), in view of Takahashi et al., US Patent No. 4,551,634 (Takahashi). This rejection is respectfully traversed.

Amended independent claim 1 recites an apparatus comprising, *inter alia*, “a common output bus for receiving signals from each of the groups, the common output bus connected to a readout circuit, the readout circuit responsive to a sensed charge.” As amended, independent claim 31 recites an imager device comprising, *inter alia*, “a readout circuit connected to outputs of said group select circuits, the readout circuit comprising a charge mode amplifier.” Amended independent claim 34 recites an imager device comprising, *inter alia*, “a common output bus coupled to outputs of the group select circuits and to a readout circuit, the readout circuit configured to amplify signals received from the image sensors.”

Amended independent claim 25 recites a “method of obtaining a readout of a pixel sensor array” comprising, *inter alia*, “selectively enabling a group select circuit and a subgroup select circuit to allow a signal from each sensor in said subgroup to pass sequentially to a readout circuit electrically connected to said group select circuit” and “sensing a charge at the readout circuit.”

Both Nair and Takahashi, even when considered in combination, fail to teach or suggest at least the above noted limitations of claims 1, 25, 31, and 34. Instead, Nair teaches an array of sense amplifier cells 114, each cell 116 is connected directly to the output of a column of sensors and accepts signals only from the single column of pixels to

which it is connected. Nair, col. 3, lines 13-20; Fig. 1. Nair's device is configured for voltage mode readout where a voltage is driven through Nair's multiplexer 118 by amplifiers 114. Accordingly, Nair is silent about a "readout circuit responsive to a sensed charge," as in claim 1; and a "readout circuit comprising a charge mode amplifier," as recited by claim 31. Likewise, Nair does not teach or suggest "sensing a charge at the readout circuit," as recited by amended independent claim 25. Further, Nair is silent about "a common output bus coupled to outputs of the group select circuits and to a readout circuit, the readout circuit configured to amplify signals received from the image sensors," as recited by claim 34.

Takahashi relates to an input circuit having a plurality of channels, and does not supplement the deficiencies of Nair. Therefore, even when Nair and Takahashi are considered together, they do not teach or suggest all limitations of any of amended independent claims 1, 25, 31, and 34. For at least these reasons, withdrawal of this rejection is respectfully requested.

Claims 16-23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nair in view of Barcella, US Patent No. 5,715,204 (Barcella). This rejection is respectfully traversed.

Amended independent claims 16 and 19 also recite methods. As amended, independent claim 16 recites a method comprising, *inter alia*, "selectively enabling a group select circuit to electrically couple a charge mode read-out amplifier to a respective set of subgroup select circuits" and, "when the group select circuit is enabled, enabling a un-amplified pixel output signal to pass from each subgroup select circuit of the respective set of subgroup select circuits in a sequential manner through the group select circuit to the charge mode read-out amplifier."

Similarly, amended independent claim 19 recites a method comprising, *inter alia*, "selectively enabling a supergroup select circuit from a set of supergroup select

circuits and a series-connected group select circuit from an associated set of group select circuits to electrically couple a charge mode read-out amplifier to a respective set of subgroup select circuits” and, “when the series-connected group select circuit and supergroup select circuit are so enabled, enabling a un-amplified pixel output signal to pass from each subgroup select circuit of the respective set of subgroup select circuits in a sequential manner through the series-connected group select circuit and supergroup select circuit to the charge mode read-out amplifier.”

Nair fails to disclose “when the group select circuit is enabled, enabling a un-amplified pixel output signal to pass from each subgroup select circuit of the respective set of subgroup select circuits in a sequential manner through the group select circuit to the charge mode read-out amplifier,” as recited by amended independent claim 16. Likewise, Nair fails to disclose that “when the series-connected group select circuit and supergroup select circuit are so enabled, enabling a un-amplified pixel output signal to pass from each subgroup select circuit of the respective set of subgroup select circuits in a sequential manner,” as recited by amended independent claim 19; or “selectively enabling a group select circuit and a subgroup select circuit to allow sequential readout of un-amplified pixel signals from each sensor in said subgroup to a readout circuit,” as recited by amended independent claim 25. Instead, Nair teaches that signals from the storage cells of the storage array 110 are fed into a sense amplifier array 114 prior to entering the analog multiplexer 118, which is made up of multiple multiplexers 130-189, and the signal processing pipe 126. Nair at col. 3, line 13 to col. 4, line 22.

Barcella does not supplement the deficiencies of Nair. Barcella relates to memory devices and provides an illustration and description of an EPROM memory chip. Barcella at col. 3, line 66- col. 4, line 22; FIG. 6. According to Barcella, a single column multiplexer 620 connects one or more selected columns for data access, and data read from the one or more columns is amplified by sense amplifiers 630. Barcella teaches one sense amplifier for each output. Barcella at col. 4, lines 11-15. Accordingly, Barcella does not teach or suggest any of the above noted limitations of independent claims 16 and 19.

A *prima facie* case of obviousness requires that the combined prior art references teach or suggest all of the claim limitations. MPEP § 2143. In the present application, Nair and Barcella do not teach all of the claim limitations of claims 16-23. Additionally, a *prima facie* case of obviousness requires the existence of some objective motivation or suggestion to combine the references. *Id.* Here, Applicants respectfully submit that the suggestion or motivation to combine the cited references is only the result of the improper use of hindsight. There is no suggestion to modify the circuitry of Nair with that of Barcella.

The crux of Nair is a device configured for voltage mode readout. Nair teaches that the array of sense amplifier cells 114 are used to drive their input signals through the multiplexer 118. Nair at col. 4, lines 3-52. Nair's device enables faster readout of the array 110. Nair at col. 4, lines 53-59. The suggested modification of Nair is a significant redesign of Nair's device and is not taught or suggested by Barcella. For at least these reasons, withdrawal of this rejection is respectfully requested.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

By 

Thomas J. D'Amico

Registration No.: 28,371

Elizabeth Parsons

Registration No.: 52,499

DICKSTEIN SHAPIRO MORIN &

OSHINSKY LLP

2101 L Street NW

Washington, DC 20037-1526

(202) 785-9700

Attorneys for Applicants